

WHAT IS CLAIMED IS:

1. A cementitious material comprising a geopolymer and stainless steel slag.
2. The cementitious material of claim 1, wherein the material is provided in the form of an unreacted mixture of the geopolymer and the stainless steel slag.
3. The cementitious material of claim 1, wherein the geopolymer comprises aluminum silicate.
4. The cementitious material of claim 1, wherein the geopolymer comprises magnesium silicate.
5. The cementitious material of claim 1, wherein the geopolymer comprises pozzolan, anhydrous aluminum silicate, silicic acid and a salt comprising potassium salt and/or sodium salt.
6. The cementitious material of claim 5, wherein the geopolymer comprises from about 4 to about 10 weight percent of the pozzolan, from about 5 to about 10 weight percent of the anhydrous aluminum silicate, from about 1 to about 5 weight percent of the silicic acid and from about 1 to about 5 weight percent of the potassium salt and/or sodium salt.
7. The cementitious material of claim 1, wherein the geopolymer comprises fumed silica, anhydrous aluminum silicate, silicic acid and a salt comprising potassium salt and/or sodium salt.
8. The cementitious material of claim 7, wherein the geopolymer comprises from about 5 to about 20 weight percent of the fumed silica, from about 40 to about 60 weight percent of the anhydrous aluminum silicate, from about 1 to about 25 weight

percent of the silicic acid, and from about 1 to about 25 weight percent of the potassium and/or sodium salt.

9. The cementitious material of claim 1, wherein the geopolymer comprises fly ash, pozzolan, silicic acid and a salt comprising potassium salt and/or sodium salt.

10. The cementitious material of claim 9, wherein the geopolymer comprises from about 5 to about 20 weight percent of the fly ash C, from about 4 to about 10 weight percent of the pozzolan, from about 1 to about 5 weight percent of the silicic acid and from about 1 to about 5 weight percent of the potassium and/or sodium salt.

11. The cementitious material of claim 1, wherein the geopolymer comprises pozzolan, nepheline cyanite, hydrous aluminum silicate, hydrous sodium hydroxide, silicic acid and a salt comprising potassium salt and/or sodium salt.

12. The cementitious material of claim 11, wherein the geopolymer comprises from about 4 to about 10 weight percent of the pozzolan, from about 4 to about 10 weight percent of the nepheline cyanite, from about 1 to about 5 weight percent of the hydrous aluminum silicate, from about 1 to about 5 weight percent of the hydrous sodium hydroxide, from about 1 to about 5 weight percent of the silicic acid and from about 1 to about 5 weight percent of the potassium and/or sodium salt.

13. The cementitious material of claim 1, wherein the geopolymer comprises fly ash, fumed silica and aluminum oxide.

14. The cementitious material of claim 13, wherein the geopolymer comprises from about 5 to about 20 weight percent of the fly ash F, from about 4 to about 10 weight percent of the fumed silica, and from about 1 to about 8 weight percent of the aluminum oxide.

15. The cementitious material of claim 1, wherein the geopolymer is provided from solid and liquid constituents.

16. The cementitious material of claim 1, wherein the geopolymer is provided from solid constituents.

17. The cementitious material of claim 1, wherein the geopolymer further comprises a polysialate and/or a polysialate-siloxo.

18. The cementitious material of claim 1, wherein the stainless steel slag comprises a calcium-containing compound.

19. The cementitious material of claim 18, wherein the stainless steel slag further comprises a silicon-containing compound.

20. The cementitious material of claim 18, wherein the calcium-containing compound is calcium silicate.

21. The cementitious material of claim 19, wherein the stainless steel slag comprises from about 0.2 weight percent to about 50 weight percent Ca and from about 0.5 weight percent to about 65 weight percent Si.

22. The cementitious material of claim 19, wherein the stainless steel slag further comprises magnesium, iron, manganese, titanium, sulfur, chromium and nickel.

23. The cementitious material of claim 19, wherein the stainless steel slag further comprises from about 0.1 weight percent to about 5 weight percent Mg, from about 0.1 weight percent to about 6 weight percent Fe, from about 0.1 weight percent to about 1 weight percent Mn, from about 0.1 weight percent to about 0.5 weight percent Ti, from about 0.01 weight percent to about 2.5 weight percent S, from about 0.3 weight

percent to about 5 weight percent Cr, and from about 0.01 weight percent to about 1 weight percent Ni.

24. The cementitious material of claim 1, wherein the stainless steel slag comprises a silicate including at least one element selected from calcium, magnesium, iron, aluminum, manganese, titanium, sulfur, chromium and/or nickel.

25. The cementitious material of claim 1, wherein the stainless steel slag comprises an oxide including at least one element selected from calcium, silicon, magnesium, iron, aluminum, manganese, titanium, sulfur, chromium and/or nickel.

26. The cementitious material of claim 1, wherein the stainless steel slag has an average particle size of less than about 100 micrometers.

27. The cementitious material of claim 26, wherein the stainless steel slag has an average particle size of from about 1 to about 50 micrometers.

28. The cementitious material of claim 1, further comprising hydraulic cement.

29. The cementitious material of claim 26, wherein the hydraulic cement comprises Portland cement.

30. A concrete material comprising, a cementitious material comprising stainless steel slag, a geopolymer and hydraulic cement.

31. The concrete material of claim 30, wherein the hydraulic cement is Portland cement.

32. The concrete material of claim 30, further comprising sand, aggregate, plasticizers and/or fibers.

33. The concrete material of claim 30, wherein the cementitious material comprises from about 10 to about 30 weight percent of the concrete material.
34. The concrete material of claim 30, wherein the geopolymer comprises aluminum silicate and/or magnesium silicate.
35. The concrete material of claim 30, wherein the stainless steel slag comprises a silicate including at least one element selected from calcium, magnesium, iron, aluminum, manganese, titanium, sulfur, chromium and/or nickel; or an oxide including at least one element selected from calcium, silicon, magnesium, iron, aluminum, manganese, titanium, sulfur, chromium and/or nickel.
36. The concrete material of claim 30, wherein the geopolymer is provided from solid and liquid constituents.
37. The concrete material of claim 30, wherein the geopolymer is provided from solid constituents.
38. A reacted mixture of a geopolymer, stainless steel slag and water.
39. The reacted mixture of claim 38, further comprising hydraulic cement.
40. The reacted mixture of claim 38, wherein the hydraulic cement is Portland cement.
41. A method of making reacted cementitious material, the method comprising combining stainless steel slag, geopolymer and water to form a reacted mixture.

42. The method of claim 41, further comprising combining hydraulic cement to form the reacted mixture.

43. The method of claim 41, wherein the geopolymer is provided from solid and liquid constituents.

44. The method of claim 43, wherein the stainless steel slag and the solid constituent of the geopolymer are combined as a solid mixture, the water and the liquid constituent of the geopolymer are combined as a liquid mixture, and the solid mixture and liquid mixture are combined.

45. The method of claim 44, further comprising combining hydraulic cement to the solid mixture.